

What is claimed is:

1. A fuel cell stack comprising a fuel cell unit
composed of a solid polymer ion exchange membrane interposed
between an anode electrode and a cathode electrode, and
separators for supporting said fuel cell unit interposed
therebetween, said fuel cell units and said separators being
stacked in a horizontal direction, said fuel cell stack
including:

a communication hole which is provided to penetrate
through said separator, for allowing a reaction gas
containing a fuel gas or an oxygen-containing gas to flow
therethrough;

gas flow passages which communicate with said
communication hole and which are provided in electrode
power-generating surfaces of said separators while
meandering in said horizontal direction, for supplying said
reaction gas to said anode electrode or said cathode
electrode; and

a porous water-absorbing tube which is arranged in said
communication hole, for discharging water.

2. The fuel cell stack according to claim 1, wherein:
said gas flow passages are provided in a direction of
gravity while meandering in said horizontal direction; and
an outlet of said porous water-absorbing tube is set at
a position higher than said communication hole for said

reaction gas.

5 3. The fuel cell stack according to claim 1, wherein
said porous water-absorbing tube is installed at a position
separated from said gas flow passages downwardly in said
direction of gravity in said communication hole.

10 4. The fuel cell stack according to claim 1, wherein:
said porous water-absorbing tube includes a plurality
of wire members wound around an outer circumference of a
core member; and
a space is formed by bundling said wire members.

15 5. The fuel cell stack according to claim 1, wherein
said porous water-absorbing tube includes:
a pipe member having a plurality of holes formed at its
outer circumference; and
a plurality of wire members accommodated in said pipe
member.

20 6. The fuel cell stack according to claim 1, wherein
said porous water-absorbing tube includes a water-absorbing
member which is arranged on a lower side in a direction of
gravity of said communication hole.

25 7. The fuel cell stack according to claim 1, wherein
at least one of said outlet side communication holes for

said reaction gas is provided with a discharge hole for supplying said reaction gas at a deep portion as viewed from a discharge port.

5 8. The fuel cell stack according to claim 7, wherein said inlet side communication hole and said outlet side communication hole are connected with a bypass flow passage at a deep portion as viewed from a supply port of said inlet side communication hole and at a deep portion as viewed from said discharge port of said outlet side communication hole, and an outlet of said bypass flow passage is constructed as said discharge hole which is open at said deep portion of said outlet side communication hole.

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9. A fuel cell stack comprising a fuel cell unit composed of a solid polymer ion exchange membrane interposed between an anode electrode and a cathode electrode, and separators for supporting said fuel cell unit interposed therebetween, said fuel cell units and said separators being stacked in a horizontal direction, said fuel cell stack including:

an inlet side communication hole which is provided to penetrate through said separators, for supplying a reaction gas containing a fuel gas or an oxygen-containing gas;

an outlet side communication hole for discharging a reacted gas corresponding to said reaction gas; and

a discharge hole which is provided at a deep portion as

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viewed from a discharge port, for at least one of said outlet side communication holes, for supplying said reaction gas.

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10. The fuel cell stack according to claim 9, wherein a supply port of said inlet side communication hole and said discharge port of said outlet side communication hole are provided on an identical side.

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11. The fuel cell stack according to claim 9, wherein said inlet side communication hole and said outlet side communication hole are connected with a bypass flow passage at a deep portion as viewed from a supply port of said inlet side communication hole and at a deep portion as viewed from said discharge port of said outlet side communication hole, and an outlet of said bypass flow passage is constructed as said discharge hole which is open at said deep portion of said outlet side communication hole.

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12. The fuel cell stack according to claim 11, wherein a number of flow passages communicating with said inlet side communication hole, of said bypass flow passage is set to be larger than a number of flow passages communicating with said outlet side communication hole.

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13. The fuel cell stack according to claim 11, wherein a position of an inlet hole of said bypass flow passage is

set to be lower than a bottom of said inlet side communication hole.

5 14. The fuel cell stack according to claim 9, wherein a position of said discharge hole is set at a position lower than a lowermost position of reaction gas flow passages provided in electrode power-generating surfaces of said separators.

10 15. A fuel cell stack comprising a plurality of fuel cell units each composed of a solid polymer ion exchange membrane interposed between an anode electrode and a cathode electrode, said plurality of fuel cell units being stacked in a horizontal direction with separators intervening therebetween, said fuel cell stack including:

15 an inlet side communication hole which is provided to penetrate through said separators, for supplying a reaction gas containing a fuel gas or an oxygen-containing gas;

20 an outlet side communication hole for discharging a reacted gas corresponding to said reaction gas; and

a suction member which is provided at the inside of said inlet side communication hole or said outlet side communication hole and which has an opening for sucking retained water.

25 16. The fuel cell stack according to claim 15, wherein said inlet side communication hole or said outlet side

communication hole, which is provided with said suction member, is set at lower positions in a direction of gravity in planes of said separators.

5 17. The fuel cell stack according to claim 15, wherein an outlet side flow passage of said suction member is connected to a downstream side of a back pressure valve provided in a flow passage for said gas discharged from said outlet side communication hole.

10 18. The fuel cell stack according to claim 17, wherein an ejector section is formed with a throttle section in said outlet side flow passage of said suction member.

15 19. The fuel cell stack according to claim 15, wherein said suction member is a drainage pipe, and a suction hole, which serves as said opening, is open downwardly at a lower wall at an end portion of said drainage pipe.